

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for scanning an object with a surface measurement probe mounted on a coordinate positioning machine, the probe having a definable servo direction vector, the method comprising the steps of:

using translational movement of the coordinate positioning machine to move the probe along an at least part nominally spiral path about an axis which intersects the object;

wherein the servo direction vector for the probe is directed nominally towards the axis of the at least part nominally spiral path;

and wherein the servo direction vector for the probe is at an angle not parallel and not perpendicular to said axis of the nominally spiral path and at an angle not parallel and not perpendicular to a plane perpendicular to said axis of the at least part nominally spiral path during the scanning of the object.

2. (Previously Presented) A method according to claim 1 wherein the object has an unknown surface profile.

3. (Previously Presented) A method according to claim 1 wherein the object has a free form surface.

4. (Previously Presented) A method according to claim 1 wherein the surface measurement probe comprises a contact probe having a deflectable stylus.

5. (Original) A method according to claim 4 wherein the method comprises a further step of moving the probe parallel to the direction of the probe servo direction vector of the probe to control probe deflection.

6. (Previously Presented) A method according to claim 1 wherein the surface measurement probe comprises a non contact probe.

7. (Original) A method according to claim 6 wherein the method comprises a further step of moving the probe parallel to the direction of the probe servo direction vector of the probe to control probe offset.

8. (Previously Presented) A method according to claim 6 wherein as the probe moves along the at least part nominal spiral path, it is rotated to keep its line of sight directed towards the axis which intersects the object.

9. (Previously Presented) A method according to claim 1 wherein the method includes the step of maintaining the probe on the nominally spiral path by movement of the probe perpendicular to the direction of the servo direction vector of the probe.

10. (Previously Presented) A method according to claim 1 wherein translational movement of the coordinate positioning machine to move the probe along an at least part nominally spiral path about an axis which intersects the object is achieved by:

defining a second axis along which the probe servo direction vector is parallel, said second axis being at an angle to said axis which intersects the object;

rotating the second axis for an at least part revolution about the first axis and translating the second axis in a direction parallel to the first axis;

moving the surface measurement probe to keep it on the axis.

11. (Original) A method according to claim 7 wherein the second axis intersects the surface of the object to be measured.

12. (Previously Presented) A method according claim 1, wherein the servo direction vector of the probe is angled at 45 degrees to the axis intersecting the part.

13. (Previously Presented) A method according to claim 1, wherein the angle between the probe direction vector and the axis which intersects the object is varied during the scan.

14. (Original) A method for scanning an object with a surface measurement probe comprising the steps of:

defining a first axis of the object;

defining a second axis, said second axis being at an angle to the first axis;

rotating the second axis for an at least part revolution about the first axis and translating the second axis in a direction parallel to the first axis;

moving the surface measurement probe to keep it on the second axis.

15. (Original) A method for scanning an object according to claim 14 wherein the probe is servoed in the direction of the second axis to keep the probe at the desired distance from the object.

16. (Previously Presented) A method according to claim 14 wherein the probe is servoed a direction perpendicular to the second axis to keep the probe on the second axis.

17. (Currently Amended) Apparatus for scanning an object comprising:
a surface measurement probe mounted on a coordinate positioning machine, said coordinate positioning machine having drive means to enable the probe to be driven translationally in several axes;

a controller which controls said drive means to move the probe along an at least part nominally spiral path about an axis which intersects said object;

wherein the controller controls the drive means such that the servo direction vector of the probe is directed nominally towards the centre of said axis of the at least part nominally spiral path;

and wherein the controller controls the drive means such that the servo direction vector of the probe is at an angle not parallel and not perpendicular to said axis of the at least part nominally spiral path and at an angle not parallel to a plane perpendicular to said of the at least part nominally spiral path during the scanning of the object.

18. (New) An apparatus according to claim 17, wherein the controller controls said drive means to move the probe along an at least part nominally spiral path about an axis which intersects the object by:

defining a second axis along which the probe servo direction vector is parallel, said second axis being at an angle to said axis which intersects the object;

rotating the second axis for an at least part revolution about the first axis and translating the second axis in a direction parallel to the first axis;

moving the surface measurement probe to keep it on the axis.